NLR Dynamic VLAN Services & the Sherpa Provisioning Tool

What is the Dynamic VLAN Service for?

- NLR Users who need direct control of VLANs in the NLR FrameNet domain

  - frequent topology changes

  - bandwidth changes

  - short-term projects

- Used to provide a fast user-controlled interface to circuit creation, not as a research project in itself

How is the Dynamic VLAN Service Operated?

- NLR's Dynamic VLAN Service uses a tool developed by the Global NOC at Indiana University called Sherpa

- Dynamic VLANs created using this tool are given the same production-level support as static VLANs by the NLR NOC

Interoperability/Compatibility with Other Software

- Sherpa API interface allows for flexible interconnection with others

- Translation utilities might be needed to communicate circuit requests & information queries between other software & the Sherpa API

Sherpa's "Workgroup" Model

- Workgroups are defined as a set of accounts with the same level of access to a pre-defined set of ports (usually user ports) on FrameNet.

- Workgroups usually map to projects

- Individuals can have choose from multiple workgroups in the interface if they have access to multiple workgroups

Interfaces to Sherpa for the Dynamic VLAN Service

- 2 interfaces into the Sherpa tool:

  - web-based interface: a point-and click interface based on the Realtime Atlas for direct user provisioning of VLANs

  - API: same API used by the web-based interface can be accessed directly by other inter-domain provisioning tools or scripted

Main Web-based Interface

- After login & workgroup selection
- Can choose:
  - Add VLAN
  - Edit/View Existing VLANs
  - Review History
  - Reserve VLAN IDs

GRNOC Sherpa: Vlan Provisioning system

Workgroup Home:

Provisioning Actions
- Add a new Vlan
- View and Edit Active Vlans

Planning Actions
- Reserve a VLAN ID for future use
- View Reservations
- Remove a reservation

Provisioning History

<< first < prev 1 2 3 4 5 6 7 8 9 10 next > last >>

Creation Date	User	Vlan Tag	Circuit ID	State	Cost	Billed Hrs
		125	NLR-CHIC-DENV-VLAN-2290	decom	$0.00	1
2009-03-14 06:25:21	jaabrow	650	NLR-CHIC-KANS-VLAN-3417	active	$0.00	63
2009-03-14 06:02:03	jaabrow	584	NLR-CHIC-SEAT-VLAN-3416	active	$0.00	63
2009-03-14 05:58:22	jaabrow	588	NLR-CHIC-TULS-VLAN-3415	active	$1,260.00	63
2009-03-14 05:56:26	jaabrow	590	NLR-BATO-CHIC-VLAN-3414	active	$0.00	63
2009-03-14 05:54:41	jaabrow	582	NLR-BATO-CHIC-VLAN-3413	active	$0.00	63
2009-03-14 05:52:42	jaabrow	587	NLR-CHIC-DENV-VLAN-3412	active	$0.00	63
2009-03-14 05:50:46	jaabrow	584	NLR-CHIC-SEAT-VLAN-3411	decom	$0.00	1
2009-03-14 05:47:07	jaabrow	393	NLR-CHIC-LOSA-VLAN-3410	active	$0.00	63
2009-03-14 05:41:38	jaabrow	77	NLR-DENV-KANS-VLAN-3409	active	$0.00	63
2009-03-14 05:38:01	jaabrow	76	NLR-CHIC-KANS-VLAN-3408	active	$0.00	63
2009-03-14 05:36:06	jaabrow	588	NLR-CHIC-TULS-VLAN-3407	active	$28.00	1
2009-03-14 05:30:11	jaabrow	571	NLR-CHIC-LOSA-VLAN-3406	active	$0.00	63
2009-03-14 05:24:38	jaabrow	384	NLR-CHIC-HOUS-VLAN-3405	active	$0.00	64
2009-03-14 05:15:50	jaabrow	419	NLR-CHIC-LOSA-VLAN-3404	active	$0.00	64
2009-03-14 05:11:38	jaabrow	418	NLR-CHIC-LOSA-VLAN-3403	active	$0.00	64
2009-03-13 16:00:48	leea	716	NLR-ELPA-HOUS-VLAN-3400	active	$15.40	77
2009-03-13 15:59:16	leea	710	NLR-HOUS-TULS-VLAN-3399	active	$15.40	77

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Provisioning Interface (Step 1 of 6)

1.Select Bandwidth

2.Choose description users & NOC will see

3.choose tag #

4.choose main contact for VLAN

GRNOC Sherpa: Vlan Provisioner

Step 1 of 6: Please update fields of interest

/ Sherpa Home / 1: Add Vlan / 2: A End / 3: Z End / 4: Path / 5: Root Bridge / 6: Provisioning

Reserve Bandwidth   3.2 Gbps

Circuit Description: test

Vlan Tag: [Suggest unused Tag] : 121

Entity: PSC

Next Action:

[Proceed to Step 2: Specify the A Endpoint]

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Provisioning Interface (Step 2 of 6)

- Select First endpoint

- click node, then choose interface

Provisioning Interface (Step 3 of 6)

- Select Second endpoint
- click node, then choose interface

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Step 3 of 6: Please provide the second endpoint, called the Z End

/ Sherpa Home / 1: Add Vlan / 2: A End / 3: Z End / 4: Path / 5: Root Bridge / 6: Provisioning

Summary
Tag : 121
BW: 3.2 Gbps
Desc: test
Root:
Ent: PSC

Endpoints
A: pitt.layer2.nlr.net   GigabitEthernet9/14
Z: chic.layer2.nlr.net   -

Select a node*(green dot)* on the map, then an interface

Interface	Description
GigabitEthernet6/1	
GigabitEthernet6/2	SUP 6 Racklan f0/7
GigabitEthernet9/14	
GigabitEthernet9/8	NLRview DC [NO-MONITOR]
GigabitEthernet9/5	CIC layer2
GigabitEthernet9/12	
GigabitEthernet9/2	VINI [NO-MONITOR]
GigabitEthernet9/4	CIC NEF
GigabitEthernet9/3	VINI [NO-MONITOR]
GigabitEthernet9/24	
GigabitEthernet9/17	
GigabitEthernet9/18	
GigabitEthernet9/21	
GigabitEthernet9/20	
GigabitEthernet9/6	NLRview SRP1 [NO-MONITOR]
GigabitEthernet9/7	NLRview SRP2 [NO-MONITOR]
GigabitEthernet9/19	
GigabitEthernet9/22	
GigabitEthernet9/1	to Indy Gigapop HR port R22

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0   280   560   840   1120 mi

Next Action:
Proceed to Step 4: Specify VLAN path

Provisioning Interface (Step 4 of 6)

- Path Selection

- Click links, or select shortest path button

- Links without sufficient available bandwidth are grayed out and unavailable

GRNOC Sherpa: Vlan Provisioner

Step 4 of 6: Please specifiy the VLAN path

/ Sherpa Home / 1: Add Vlan / 2: A End / 3: Z End / 4: Path / 5: Root Bridge / 6: Provisioning

Summary
Tag : 121
BW: 3.2 Gbps
Desc: test
Root:
Cost: $25.60 per hour (est)
Ent: PSC

Endpoints
A: pitt.layer2.nlr.net   GigabitEthernet9/14
Z: chic.layer2.nlr.net   GigabitEthernet9/17

Path Components

Circuit ID
NLR-PITT-WASH-10GE-280
NLR-WASH-RALE-10GE-227
NLR-RALE-ATLA-10GE-231
NLR-ATLA-CHIC-10GE-02164

Options

Suggest Shortest Path

Select the circuits*(green line)* on the map
or select the *suggest shortest path* button

100w 40n

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Next Action

Proceed to Step 5: Specify VLAN Root Bridge

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Provisioning Interface (Step 5 of 6)

- Root Bridge Selection

- Mostly for Multipoint Use

Provisioning Interface (Step 6 of 6)

- Final preview
- Clicking causes immediate provisioning

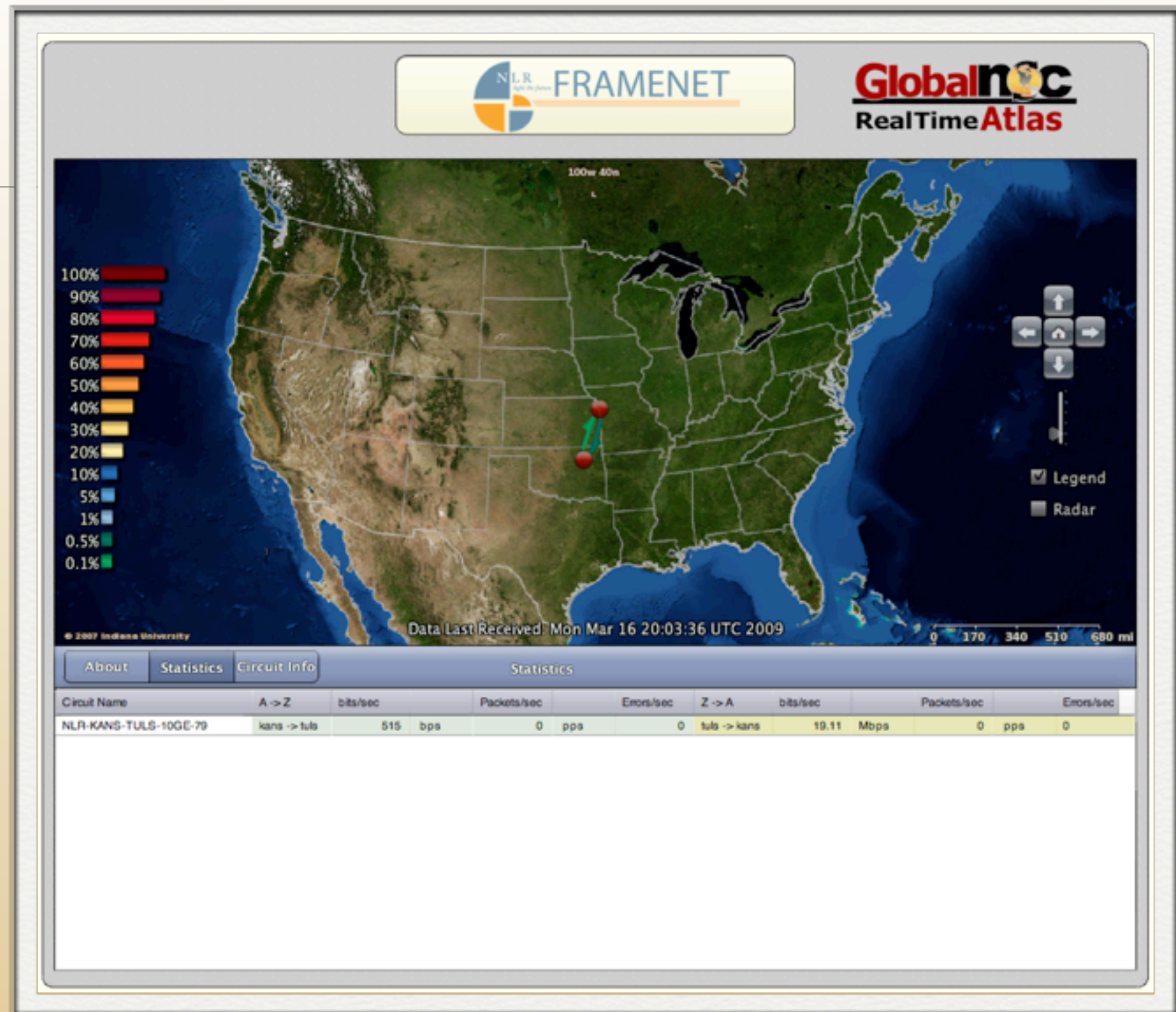# Existing VLAN View/Edit

- After logging in, selecting workgroup, and selecting existing VLAN from list

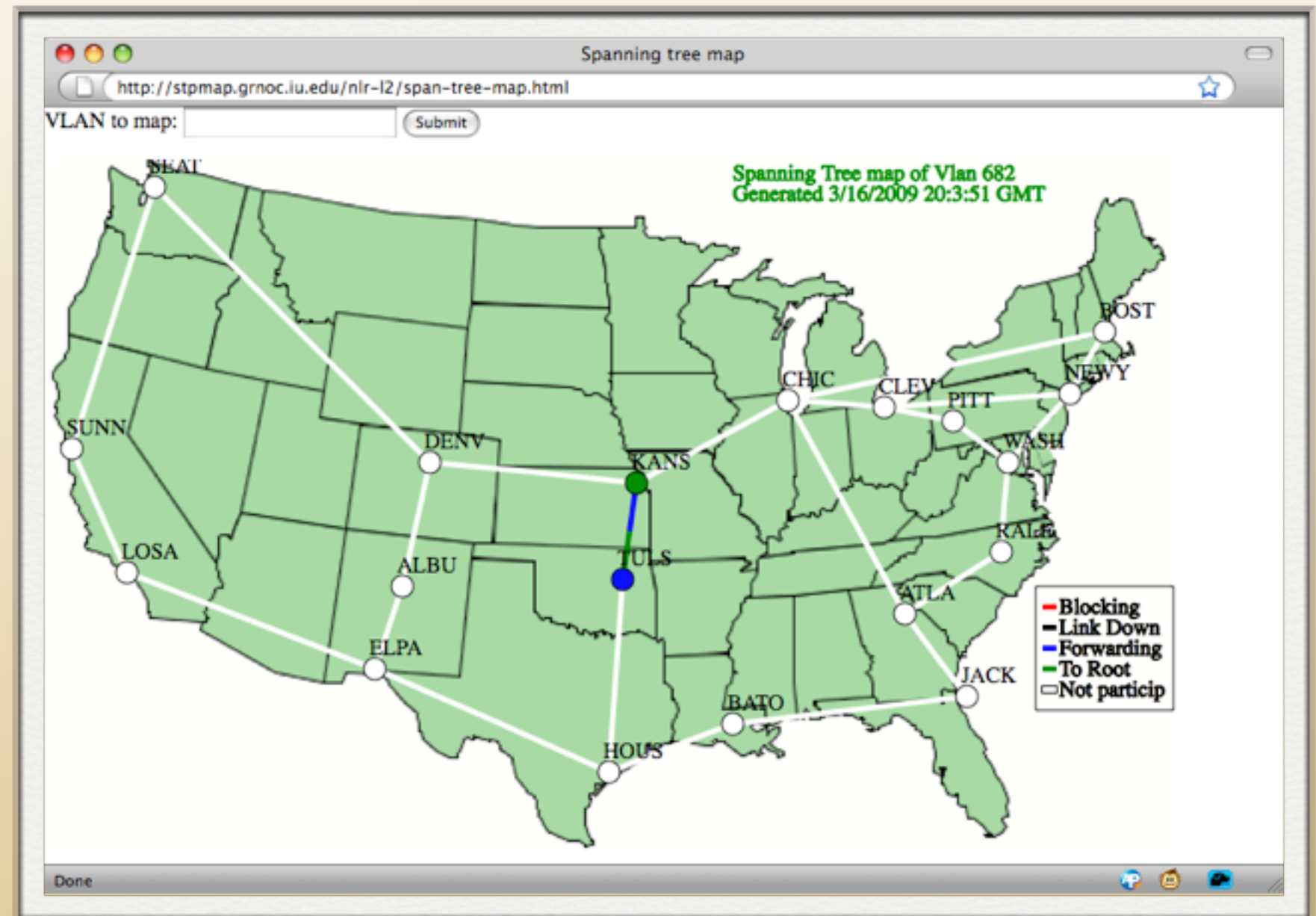- Shows Topology, bandwidth, tag, etc
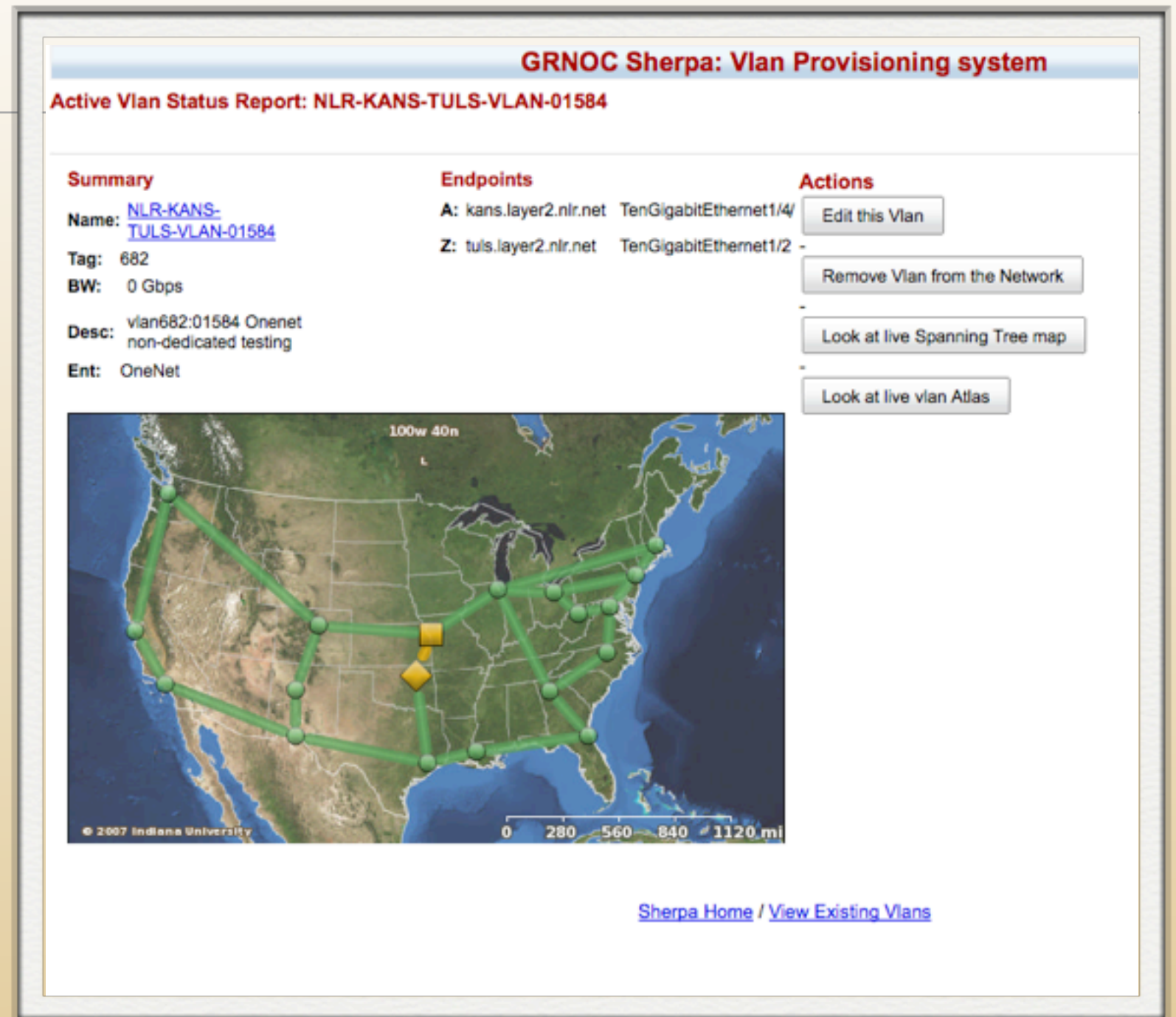
Existing VLAN View/Edit: live

- selecting "Look at live VLAN Atlas" button
- shows custom Atlas weathermap for just one VLAN

Existing VLAN View/Edit: Spanning Tree Map

- selecting "Look at live Spanning Tree Map" button
- Shows active configuration of Spanning Tree on FrameNet for VLAN
- Will be integrated into main view soon

Business Model

- Dynamic VLANs with no dedicated bandwidth are free

- Dedicated bandwidth costs model:

  - depends on:

    - # of FrameNet segments

    - amount of bandwidth

    - term of VLAN (how long it will be needed)

  - Long-term user-controlled VLANs have same cost as existing NLR static VLANs

  - Short-term user-controlled VLANs cost more

Pricing

- unit is Gbps/L2 segment/hour

- per unit Short-term Bandwidth (0-1000 hours) cost 4x the cost of Long-term Bandwidth (1 year +)

- Medium Term Bandwidth for VLANs prices falls between Short-Term and Long-Term, depending on the exact term of the VLAN
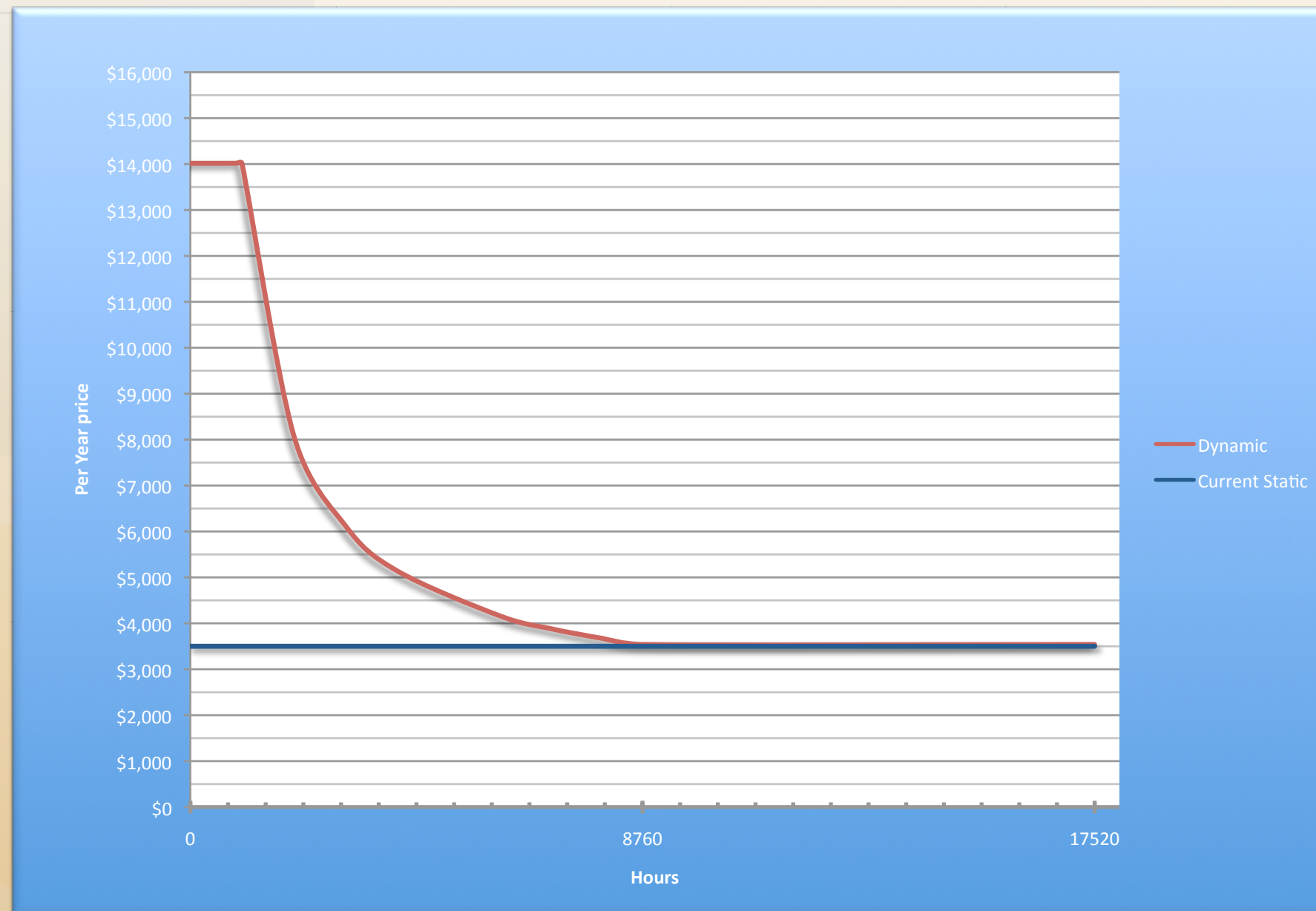
Features Coming in New Version

- New Version will be available by **3/24** (yes, next week)

- Scheduling

- Better Non-intrusive Behavior for VLAN changes

- Improved API & API examples

- VLAN ID Reservations

Scheduling

- set start & end date/time

- First come, first served

- What do we do at expiration?

  - Leave VLAN in place, convert to non-dedicated, notify users

  - Give reasonable warnings needed prior to expiration (1 month before, 1 week before, 1 day before, 1 hour before)

Improved non-intrusiveness

- Right now:

  - Changes mean: VLAN tear-down, then complete rebuild

  - This is simple and safe

- Cases where this is less than ideal

  - Going from 1G to 2G on a VLAN

  - Add a redundant path to a VLAN

- New Version is as non-intrusive as a human engineer would be

  - Some changes will still be intrusive, such as changing topology in a way that causes STP recalculation

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- Why not convert all VLANs to be configurable via Sherpa?

- Pricing is already equivalent